Dear Friend of the Institute of Human Origins

IHO’s research reputation over the last 30-plus years has been built on a stream of high-impact field discoveries. This year, IHO scientists added to that record with a significant find from one of our sites in Ethiopia. In March, a team led by IHO Research Associate Kaye Reed reported the discovery of a lower jaw from the 2.8 million-year-old site of Ledi-Geraru. Analysis of the jaw, published in the journal *Science* in March, shows that it belongs to our genus, *Homo*, predating previously known fossils of the *Homo* lineage by some 400,000 years and potentially linking *Homo* to Lucy’s genus, *Australopithecus*. The fossil was discovered by Ethiopian graduate student Chalachew Seyoum, whose graduate studies at ASU have been supported in part with funds from IHO donors. Read more about this story inside.

We are grateful to everyone who has helped support IHO’s programs through annual gifts to our operating fund, direct support of our research, investment in our long-term success through endowment gifts and bequests, or participation in one of our wonderful international tour programs. It is the broad support from many sources that enables IHO researchers to push forward on the fundamental questions about our origins—How did we become human?

While we continue to have the strong backing of ASU for our faculty and facilities, our research and outreach programs rely more than ever on the generosity of donors whose passion for the study of human origins creates the strong "public-private partnership" we enjoy with ASU.

Please consider the opportunities that your end-of-the-year gift will provide for future discovery and research and then join the quest for our origins by supporting IHO with your generous charitable gift. Enclosed you’ll find the Gift/Pledge Form for your convenience. Or, you can go to IHO’s website at https://iho.asu.edu/support/supportIHO to give securely online.

As we move into 2016, look for developing stories as research from the John Templeton Foundation grant continues to be published, and the new K-12 focused website “Ask An Anthropologist” is launched.

I thank you in advance for your support and look forward to hearing from you.

Best wishes for the New Year,

William H. Kimbel, PhD
Director
Virginia M. Ullman Professor of Natural History and the Environment

Ledi-Geraru fossil *Homo* jaw discovered by an IHO team in 2013
In the Field and Lab

The discovery of the Homo jaw at the Ledi-Geraru site, codirected by IHO Research Associates Kaye Reed and Chris Campisano, sheds light on a time period rarely preserved in eastern Africa—the time between the latest fossils of Lucy’s species Australopithecus afarensis, at around 3 million years ago, and the oldest Homo fossil, now at 2.8 million years. What happened in that relatively short evolutionary time for the transition to take place? That is one of the most exciting questions to answer in human origins science. Kaye Reed is returning to Ethiopia in January to study and analyze additional fossils, seeking data on environmental conditions to set the discovery in context. If you have not had a chance to see the video interview with Chalachew Seyoum, Kaye Reed, and IHO Director Bill Kimbel about the discovery, view it at https://asunow.asu.edu/20150304-asu-human-fossil-discovery.

Spearheaded by Bill Kimbel, the $4.9 million John Templeton Foundation three-year grant, the largest of its type for human origins research, is supporting 11 linked investigations of where, when, and how unique human capacities for complex cognition, cumulative culture, and large-scale cooperation emerged. The research projects, focusing on the Evolutionary Foundations of Human Uniqueness, have already resulted in several research publications and an expansion of IHO’s inventory of field sites to the Fiji Islands, Philippines, and Turkana, Kenya. More information on the Templeton project can be found on the IHO website at https://iho.asu.edu/research/iho-templeton-research-program.

IHO Associate Director Curtis Marean, awarded a Foundation Professorship by ASU this year, has directed archaeological field research on the southern coast of South Africa for 15 years. At the Pinnacle Point cave site, evidence of modern human adaptation stretches back some 160,000 years. In addition to the field work, the U.S.-based supercomputer “XSEDE,” has provided a simulation of the Pleistocene paleoclimate of coastal southern Africa. Combining the climatic simulation with observations of modern hunter-gatherer ecology amassed over 30 years by Research Associate Kim Hill, the IHO team is answering questions about how climate-driven shifts in resource use and demography may have led to the emergence of conflict and cooperation, the enormous scale and complexity of which are unique human traits.
New South African exploration at Knysna, 100 kilometers east of Mossel Bay by colleague Naomi Cleghorn, and on the eastern coast by IHO Assistant Research Scientist Erich Fisher are expanding IHO field research on modern human origins in coastal settings. When Fisher was recently in Pondoland, he posted two short videos about his fieldwork there. You can view them at https://vimeo.com/user5956652 (password: ASUIHO2015).

On the west coast of South Africa, Kaye Reed and IHO Research Associate Gary Schwartz excavated a fossil locality with colleagues from the University of Cape Town. The locality is thought to be at least 768,000 years old, and the fauna recovered will be able to shed light on how early hominins may have utilized coastal landscapes in the past. Meanwhile, Kim Hill, who has worked with the Ache hunter-gatherers in the Amazon forests of Paraguay for over 30 years, is studying marine coastal-foraging patterns in southern Africa, aiming to understand their potential to shed light on the Pleistocene expansion of Homo sapiens out of Africa.

The Hominin Sites and Paleolakes Drilling Project is a multinational collaboration revealing continuous, high-resolution paleoenvironmental records from drill cores taken from five ancient lake beds in Kenya and Ethiopia. Led for IHO by Chris Campisano and Kaye Reed, the goal is to document how changing environments affected human evolution across more than 4 million years of geological time. The drilling phase has been completed, and the core samples are now being analyzed. The international team was awarded nearly $10 million from the National Science Foundation and the International Continental Scientific Drilling Program.

IHO has received funding from the ASU President’s Strategic Initiatives Fund for new research on DNA and human origins. The project connects research by IHO Research Affiliates Anne Stone, Joan Silk, Ian Gilby, and Kevin Langergraber on chimpanzee and baboon genetic diversity as a window on early hominin population structure. Using ancient DNA techniques on fossil faunas from Pinnacle Point excavations, Anne Stone is working with Curtis Marean’s group to investigate migratory movements of Pleistocene prey populations as a mirror of early modern human expansion.
IHO Founding Director Don Johanson is teaching a free, online course in Human Origins through ASU’s new partnership with edX. Explore the scientific evidence for human evolution, our fossil relatives, and the place of humankind in the natural world. The next online offering begins in March 2016. Sign up at https://www.edx.org/course/human-origins-asux-asm246.

At Sarangani Bay, Mindanao, in the Philippines, IHO Research Associate Kim Hill is studying coastal foraging conditions to understand the effects of habitat heterogeneity, tidal cycles, weather, and gender/age on foraging success. These results will be compared and integrated into coastal modeling for South Africa.

(left two images)

IHO Research Affiliate Rob Boyd is interested in how, through cumulative culture, humans create, use, modify, and pass on technologies that are too complex for any one person to have invented in a single lifetime. Researchers are working with local islanders to understand how small improvements over many generations in traditional house building methods combine with independent innovations to create and spread new cultural information. IHO Research Affiliate Joan Silk is working on a cross-cultural educational exchange with K–12 schools in Fiji to reciprocally link classrooms, teachers, and resources in the U.S.

(left two images)

Read more about breaking IHO science by joining IHO’s email newsletter list. Please make sure your email is up-to-date by emailing Julie Russ (jruss@asu.edu) to stay informed.
In two papers in the journal *Science*, the IHO team reported the results of the analysis of the Ledi-Geraru jaw—"Early *Homo* at 2.8 Ma from Ledi-Geraru, Afar, Ethiopia," and the geological analysis—"Late Pliocene fossiliferous sedimentary record and the environmental context of early *Homo* from Afar, Ethiopia." The research, coauthored by IHO Research Associates Kaye Reed and Chris Campisano and IHO Director Bill Kimbel, plus a large international team of collaborators, was carried in over 400 online and print publications around the world including *The New York Times*, *PBS NewsHour*, *USA Today*, and *National Geographic*.

IHO Director Bill Kimbel and Associate Director Curtis Marean were invited speakers in the "Major Transitions in Human Evolution" workshop at The Royal Society, London. You can listen to the presentations at https://royalsociety.org/events/2015/10/major-transitions/.

Humans innovate much more if they are cooperating as a group in a social learning situation, than if operating as "smart" individuals, found IHO Research Affiliate Rob Boyd and Postdoctoral Researcher Maxime Derex. Their research, published in *Nature Communications*, shows how cognitive leaps in human evolution may have occurred as a result of cooperation within small social groups.

For the second time, an article written by Curtis Marean was the cover story for *Scientific American*. The article, "The Most Invasive Species of All," argues that modern humans were able to disperse across the planet due to the evolution of intricate social cooperation and the command of complex technology, both of which, he argues, accompanied early migrations out of Africa. Marean was also the featured speaker at IHO’s annual event held at The Explorers Club in New York City. An extensive interview with Marean is featured in the online magazine Hakai at http://www.hakaimagazine.com/article-long/brine-revolution.

Marean’s scientific research groups organized two symposia on their work focused on the south coast of South Africa at the 2015 Society for American Archaeology. Thirty papers were presented over two days, spanning the last five years of field research.

Spurred by the emergence of isolated South American indigenous groups over the past few years, *Science* devoted a special section to the subject, which included an editorial "Protecting Isolated Tribes," by IHO Research Associate Kim Hill (along with University of Missouri-Columbia colleague Robert Walker).

Using one of the most comprehensive ethnographic records—the Western North American Indian Dataset—IHO Affiliate Researchers Sarah Mathew and Charles Perreault compared the effects of environment and cultural history to the importance of cultural transmission. Their study was published in the *Proceedings of the Royal Society B*. At stake is understanding whether human uniqueness is driven by our large brains and intelligence, allowing us to adapt to different environments, or by our unprecedented reliance on social learning or culture.
awards and students

IHO Founding Director Donald C. Johanson was presented with California Academy of Sciences highest honor—the Fellows Medal—given to scientists who have made outstanding contributions to their specific scientific fields. Johanson was awarded the medal for his pioneering outreach and research on the science of human evolution. The award noted that Johanson’s publication of _Lucy: The Beginnings of Humankind_ “inspired countless students and scholars and marked a turn in the way the science of human origins was presented to the public.”

For her contributions to science, IHO Research Affiliate Joan Silk was elected to the American Academy of Arts and Sciences. Silk is a highly regarded scholar of primate behavioral ecology, evolution, and sociality.

IHO Research Affiliate Sarah Mathew became one of 32 inaugural fellows of the Andrew Carnegie Fellows Program, bringing her $200,000 to launch two studies on the question “Is the Cultural Boundary Also the Moral Boundary?” Mathew’s research will focus on the social boundaries of people’s moral and cooperative dispositions and whether there are evolved cross-cultural patterns in the psychological costs of killing in warfare.

During the past year, two IHO-affiliated graduate students in the School of Human Evolution and Social Change received their doctoral degrees in anthropology. Amy Shapiro, advised by Kaye Reed, defended her dissertation on “The relationship between variation in dental microwear textures and annual, seasonal, and monthly dietary variation in African Old World monkeys (Cercopithecidae).” Shapiro has taken a position as Adjunct Professor, Anthropology Department, San Francisco State University. Ben Schoville’s dissertation, supervised by Curtis Marean, is “Landscape variability in tool-use and edge damage formation in South African Middle Stone Age lithic assemblages.” Both Schoville and Shapiro benefited from funding from the Elizabeth H. Harmon Research Endowment. Frank and Judy Harmon established the endowment in memory of their daughter Elizabeth, who earned her PhD at ASU with advisor Bill Kimbel in 2005.

outreach


Exploring Time Expeditions, IHO’s international travel program, led 20 explorers on an adventure to the archaeological sites of Indonesia (Java and Borneo) with Don Johanson. The group viewed wild-living orangutans at the Borneo preserve with a talk by Dr. Biruté Galdikas and original Java Man fossils discovered in 1891.

Reservations are now being accepted for an _Israel trip led by Bill Kimbel and IHO International Research Affiliate Yoel Rak_, in May 2016, and a _South Africa trip with Kaye Reed_, in October 2016. Both trips have a limited capacity—20 for Israel and 14 for South Africa. If you are interested in either of these adventures, act soon! Email or call Julie Russ (jruss@asu.edu | 480.727.6571) to be placed on the reserved or waiting list. More trip information can be found at https://iho.asu.edu/outreach/travel.

Research Affiliates Rob Boyd and Joan Silk have organized an “Evolution of Social Complexity” lecture series, which continues through April 2016. Lectures take place on Wednesdays at noon on the ASU Tempe campus. Interested in attending? See the IHO website homepage for more information.

If you would like to visit the IHO office and labs, come to ASU’s “Night of the Open Door” open-house on Saturday evening, February 27, 2015. See the “Lucy” skeleton cast and learn about paleoanthropology from IHO-affiliated graduate students.

Access online giving at http://asufoundation.org/IHO. The appeal code is L1116. Thank you in advance for your generous gift!